

TABLE 4.—Mean altitudes and temperatures of significant points identifiable as tropopause during September 1940, classified according to the potential temperatures (10° intervals between 290° and 409° A.) with which they are identified (based on radiosonde observations)—Continued

Stations.....	Phoenix, Ariz.			Sault Ste Marie, Mich.			Swan Island, W. I.			Atlantic Sta. No. 1 ¹			Atlantic Sta. No. 2 ²		
Potential temperatures ° A.	Number of cases	Mean altitude (km.) m. s. l.	Mean temperature °C.	Number of cases	Mean altitude (km.) m. s. l.	Mean temperature °C.	Number of cases	Mean altitude (km.) m. s. l.	Mean temperature °C.	Number of cases	Mean altitude (km.) m. s. l.	Mean temperature °C.	Number of cases	Mean altitude (km.) m. s. l.	Mean temperature °C.
290-299.....				1	5.5	-31.0									
300-309.....				5	6.9	-37.8									
310-319.....				14	8.4	-44.6									
320-329.....	1	8.7	-38.0	19	10.3	-52.5				1	8.8	-46.0			
330-339.....	16	9.9	-38.8	15	11.1	-53.7				5	9.7	-45.8	2	9.6	-44.5
340-349.....	27	11.4	-47.2	9	12.2	-57.8	20	11.8	-49.2	8	11.3	-53.3	20	11.1	-51.0
350-359.....	15	13.2	-58.7	2	12.4	-58.5	20	13.6	-61.6	4	12.3	-57.9	19	12.5	-58.8
360-369.....	15	14.5	-64.4	2	13.0	-60.5	18	15.5	-74.1	4	13.7	-63.7	10	13.3	-60.8
370-379.....	16	15.4	-67.4	3	14.6	-62.3	9	16.4	-77.4	5	14.2	-64.6	4	14.3	-65.8
380-389.....	12	16.2	-69.8	6	14.4	-57.3	5	17.2	-80.0	4	14.8	-63.6	4	15.0	-66.0
390-399.....	2	16.6	-69.5	1	15.1	-66.0				1	15.6	-62.0	1	14.8	-61.0
400-409.....	7	17.1	-69.4	5	16.0	-59.0	1	17.7	-77.0	1	16.2	-60.0			
Weighted means.....		13.4	-56.9		11.1	-52.2		14.2	-64.7		12.6	-57.5		12.4	-57.0
Mean potential temperature °A. (weighted).....		360.0			338.9			359.6			350.4			345.9	
Number days with observations.....		29			24			24			18			23	

¹ In or near the 5° square: Lat. 35°00' N. to 40°00' N. Long. 55°00' W. to 60°00' W.² In or near the 5° square: Lat. 40°00' N. to 45°00' N. Long. 40°00' W. to 45°00' W.

WEATHER ON THE NORTH ATLANTIC OCEAN

By H. C. HUNTER

Atmospheric pressure.—The pressure was lower than normal over most North Atlantic waters that are covered by reports at hand. There was a considerable deficiency from the vicinity of New England southward to the northern West Indies, the station at Turks Island having average pressure 2.5 millibars (0.074 inch) less than normal. On the other hand, pressure averaged somewhat greater than normal near northern Newfoundland. At Horta the pressure was nearly always above normal save for one week starting the 20th, when it was below, part of the week decidedly so.

The extremes of pressure found in vessel reports at hand were 1031.8 and 965.1 millibars (30.47 and 28.50 inches). The higher reading was noted on the American liner *Exeter*, late on the 13th, a short distance south of the central Azores. Table 1 indicates slightly higher readings at the land station at Horta within a few hours of that time.

The low mark was recorded on the American steamship *Franklin K. Lane*, near 38° N., 70½° W., at 9 p. m. of the 1st, when it met one of the intense storms from

TABLE 1.—Averages, departures, and extremes of atmospheric pressure (sea level) at selected stations for the North Atlantic Ocean and its shores, September 1940

Station	Average pressure	Departure from normal	Highest	Date	Lowest	Date
	Millibars	Millibars	Millibars		Millibars	
Lisbon, Portugal ¹	1,020.9		1,023	10	1,008	30
Horta, Azores	1,014.5	-0.8	1,032	13, 14	994	25
Belle Isle, Newfoundland ¹	1,014.5	+2.3	1,028	15	990	26
Halifax, Nova Scotia	1,016.3	-1.3	1,028	29, 30	986	16
Nantucket	1,016.3	-2.3	1,028	30	993	2
Hatteras	1,016.3	-1.7	1,026	18	1,003	11
Turks Island	1,012.7	-2.5	1,016	24, 25	1,005	13
Key West	1,012.2	-1.7	1,017	18	1,007	9
New Orleans	1,015.6	+0.4	1,022	29	1,007	24

¹ For 16 days.² For 25 days.

NOTE.—All data based on available observations, departures compiled from best available normals related to time of observation, except Hatteras, Key West, Nantucket, and New Orleans, which are 24-hour corrected means.

the Tropics. Readings quite low for that part of the ocean were noted in or near the Azores area, on both ship and shore, during the 23d to 25th, as detailed below. In high latitudes a reading of 995.6 millibars (29.40 inches) was recorded near Cape Farewell, on the 1st.

Cyclones and gales.—The reports now available fail to indicate that any low which had come eastward over the North American continent was of much importance when over North Atlantic waters. During the first 3 weeks of the month the middle latitudes of the ocean were comparatively quiet, except as influenced by storms originating near or within the Tropics.

A low of unusual interest was noted early on the 22d, when the American steamship *Otho*, westbound, near 29½° N., 46½° W., met a south-southwest whole gale, the barometer dropping to 995.6 millibars (29.40 inches). The wind shifted from south to west-northwest. Late in the forenoon of the 23d this storm was encountered by the Portuguese steamship *Lobito*, about 700 miles to east-northeastward of the *Otho*'s position, the wind blowing with full hurricane force from the southwest, while the barometer was 977.0 millibars (28.85 inches).

Later on the 23d this storm was felt in the westernmost Azores. The following extract is from a report kindly furnished to this office by the Meteorological Service of the Azores, Angra do Heroismo, Terceira Island:

The storm * * * came over the Azores, passing south of Flores and Fayal—minimum pressure, at Horta 992 mb. (29.29 inches) at 4 h. the 24th—and turning northeast passed over San Miguel—minimum 984 mb. (29.06 inches) at 13 h. the 24th. (Hours herein are 30th meridian time.)

It went then around, coming west-southwest to Terceira where the central calm was well felt near 7 h. 30 m. the 25th—minimum 984 mb.—passed again south of Fayal—second minimum 991 mb. (29.26 inches) at 19 h. 30 m.—and it disappeared westward on the 26th, after being felt a second time at Flores Island.

Wind attained force 9 and sometimes 10 (Beaufort), stronger before the passing of the center. Maximum 105 kilometers (65 miles) per hour at 4 h. 45 m. on the 25th, from the north—a gust, not steady velocity.

Rain was unusually heavy from the 22d to the 26th. At Angra do Heroismo 333 mm. (13.11 inches) of rain were collected, that is, one-third of the average total rain in a year.

Many damages were caused to houses and crops, and some boats were taken by the heavy seas from the places where they had been pulled ashore. An uncommonly high swell was remarked

at Angra do Heroismo, running from the southwest on the morning of the 24th. * * * No lives lost.

By the latter part of the 27th this cyclone was within the southward extending trough of a large low area near southern Greenland, and it apparently thereafter drew away to the northeastward with lessening force.

During the final 4 days of September a cyclone of moderate intensity moved slowly northward off the coasts of Florida, Georgia, and the Carolinas. One whole gale was noted by a vessel within the area affected.

On page 245 in this REVIEW is an account of two disturbances which advanced from the region of the West Indies along fairly similar paths to eastward of the coast of the United States. The earlier was not far from Cape Hatteras when September started, and three reports of hurricane winds also a report of force 11 are mentioned in the accompanying table of ocean gales.

The later storm was followed from the 11th, to north-eastward of Saint Martin, to the 17th, when it had reached Nova Scotia. One vessel reported force 12 and another force 11 as met while under the influence of this storm.

A less important disturbance, which crossed the western Gulf of Mexico about the 21st to 23d, is described in the same article.

Fog.—The available reports indicate but little fog this month, yet some details of occurrence are of interest. In the wake of the second September disturbance of tropical origin, fog was noted on the 16th within four adjacent 5° squares, between 20° and 30° N., 65° and 75° W. Similarly, soon after the earlier disturbance had passed, there was fog on the 2d and 3d at positions to eastward of the coast from the Carolinas to New Jersey.

Near New England and southwestern Nova Scotia fog occurred on a few days, but after the 10th no fog was reported as occurring there save on the 20th. In this area the square 40° to 45° N., 65° to 70° W., yielded reports on 5 days, leading all other North Atlantic areas as far as advices show. However, records of earlier years indicate that on the average fog is seen there on 11 September days.

To the eastward of the forty-fifth meridian no mention of fog has been found in the reports at hand for this month.